

### REMARKS

Claims 1-23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Codazzi (U.S. Patent No. 5,275,040) in view of Lowell et al. (U.S. Patent No. 5,228,347) and/or Akiyama (U.S. Patent No. 4,557,148). In response, Applicants amended independent claims 1, 13, 17-20 and 23 to include the feature of pulse Doppler method and transit time method for measuring a flow rate from the preamble of the claims to the body of the claims, and also clarified the first and second determining steps, and respectfully traverse the rejection.

Independent claim 1 now calls for a first determining step of determining whether a current measuring method is a pulse Doppler method or a transit time method, and a second determining step of determining reliability of a reception wave in the current measuring method. Method claim 13 is similarly amended.

Independent claim 17 calls for an ultrasonic flowmeter for measuring a flow rate of a fluid, and includes a first determination unit determining whether a current measuring method is a pulse Doppler method or a transit time method, and a second determination unit determining reliability of a reception wave in the current measuring method. Claim 18 is similarly amended like claim 17.

Independent claim 19 calls for a computer-readable recording medium storing a program used to direct a computer of an ultrasonic flowmeter for measuring a flow rate of a fluid to realize a function of determining whether a current measuring method is a pulse Doppler method or a transit time method, and a function of determining reliability of a

reception wave in the current measuring method. Independent claims 20 is similarly amended like independent claim 19.

Independent claim 23 calls for an electronic device for use with an ultrasonic flowmeter for measuring a flow rate of a fluid. The ultrasonic flowmeter includes a first determination unit determining whether a current measuring method is a pulse Doppler method or a transit time method. Further included is a second determination unit determining reliability of a reception wave in the current measuring method. Applicants respectfully submit that the above-described features of the amended claims are not disclosed or suggested by any of the cited references, either alone or in combination.

As shown in FIG. 1 of the present Application, an ultrasonic flowmeter capable of performing a flowrate measurement using both a pulse Doppler method and a transit time method is shown. The ultrasonic flowmeter includes a transducer 1 for flow rate measurement in the pulse Doppler method which is connected to Doppler method circuitry 4. Similarly, transducers 2 and 3 are connected to transit time method circuitry 5 which performs amplification and analog/digital conversion for a flow rate measurement in the transit time method. A switch circuit 6 is connected to the circuits 4, 5 and allows for switching between the pulse Doppler method and the transit time method. A control unit 7 controls the ultrasonic flowmeter, and in particular includes a flow rate calculating unit 8, output processing unit 9, and method switching unit 10 that allow for switching between the pulse Doppler method and a transit time method as needed. Applicants respectfully submit that none of the cited references taken alone or together disclose or suggest the basic feature

of the present invention of applying too measuring methods (i.e., a pulse Doppler method and a transit time method) in selecting one of the two methods in accordance with a determination (i.e., when it is determined that the reliability of the current measuring method is insufficient, and therefore another measuring method is needed).

None of the Codazzi, Lowell or Akiyama references discloses or suggests applying both a pulse Doppler method and a transit time method to measure a flow rate of a fluid. Col. 21, line 40 *et seq.* of Codazzi teaches a Doppler shift embodiment wherein a source of an acoustic signal is a mud pump or pumps 11 which generates an acoustic signal of fundamental frequency at  $f_0$ . However, the purpose of this signal is for detecting a gas influx into the annulus and monitor the change of the speed of sound through a distance D, as illustrated in FIG. 13. With no gas in the annulus, the speed of sound is approximately constant. If an influx of gas in the borehole occurs, then the speed of sound in the annulus is drastically reduced because of the gas compressibility. Thus, the Doppler shift embodiment of Codazzi is not directed to determining a flow rate of a fluid by using a pulse Doppler method.

Similarly, Lowell fails to disclose or suggest a flow rate by a pulse Doppler method. On page 5, second paragraph of the outstanding Office Action, the Examiner asserts Lowell teaches a pulse Doppler method because FIG. 1 of Lowell has processing circuitry 24 that drives transducer 14a and measures a delay between the time at which transducer 14a is driven at the time at which transducer 14b receives the resulting sonic signal. Processing circuitry 24 also performs similar operations with transducer pair 16a and 16b, 18a and 18b,

and 20a and 20b. However, contrary to the Examiner's assertions, all of these transducers measure a flow rate by using a transit time method, and therefore a pulse Doppler method is not disclosed.

Akiyama is also silent regarding a pulse Doppler method. Col. 13, lines 14-16 of Akiyama merely teach a flow rate computing unit for computing flow rate of the fluid in response to a reception time signal from the ultrasonic propagation path. Accordingly, even if combined, none of the Codazzi, Lowell, and/or Akiyama references disclose or suggest a pulse Doppler method, let alone the combination of two methods which include a pulse Doppler method and a transit time method. For at least this reason, the §103(a) rejection as it applies to the amended claims is improper, and should be withdrawn, which is respectfully requested.

Applicants further traverse the rejection because none of the cited references disclose or suggest selecting one of the two methods based on a determination. More specifically, none of the cited references disclose or suggest switching to the other measuring method when it is determined that the reliability of the current measuring method is insufficient. Each of the independent claims now clarify that two measuring methods can be applied, which are a pulse Doppler method and a transit time method. Additionally, after one of the methods is applied, a second method is selected depending on the situation (i.e., whether the reception wave in the current measuring method is reliable).

As discussed above with respect to FIG. 1, the present Application has a switch circuit 6 which can switch between the Doppler method circuitry 4 and the transit time

method circuitry 5. None of the cited references disclose or suggest a switch circuit 6 that allows for switching between two different flow rate measurement methods. Moreover, none of the cited references disclose or suggest selecting a different measurement method based on a determination, or even calculating a determination to determine the reliability of a reception wave as being insufficient. Since none of the Codazzi, Lowell or Akiyama references alone, or in combination, disclose or suggest the above-described features, for this additional reason, withdrawal of the §103(a) rejection of claims 1-23 is respectfully requested.

New claim 24 is added and further calls for an ultrasonic flowmeter that has a first measurement unit measuring according to a pulse Doppler method, and a second measurement unit measuring according to a transit time method. Applicants earnestly solicit allowance of new claim 24 for the reasons recited above.

For all of the foregoing reasons, Applicants submit that this Application is in condition for allowance, which is respectfully requested. The Examiner is invited to contact the undersigned attorney if an interview would expedite prosecution.

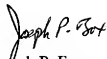
If a Petition under 37 C.F.R. §1.136(a) for an extension of time for response is required to make the attached response timely, it is hereby petitioned under 37 C.F.R. §1.136(a) for an extension of time for response in the above-identified application for the period required to make the attached response timely. The Commissioner is hereby authorized to charge any additional fees which may be required to this Application under 37 C.F.R. §§1.16-1.17, or credit any overpayment, to Deposit Account No. 07-2069.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

June 8, 2009  
300 South Wacker Drive  
Suite 2500  
Chicago, Illinois 60606  
Telephone: 312.360.0080  
Facsimile: 312.360.9315  
Customer No. 24978

By

  
Joseph P. Fox  
Registration No. 41,760